



Docket No.: 20347 US1 (C38435/128985)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : )  
Heinrich BACHMANN, *et al.* )  
Serial No.: 10/053,192 ) Examiner: not yet assigned  
Filed: January 15, 2002 ) Art Unit: 1652  
For:  **$\beta,\beta$ -CAROTENE 15,15'-** )  
**MONOOXYGENASES, NUCLEIC** )  
**ACID SEQUENCES CODING** )  
**THEREFOR AND THEIR USE** )

New York, NY  
September 30, 2002

TRANSMITTAL OF PROPOSED DRAWING CORRECTION

Box Missing Parts  
Commissioner For Patents  
Washington, D.C. 20231  
Sir:

In accordance with 37 CFR § 121(d) and MPEP § 608.02(q) and at the request of the Examiner, (see Notice to Filing Missing Parts mailed April 29, 2002), the attached corrected drawing figures (see Exhibit 1) are submitted for consideration. It is respectfully requested that the Examiner enter corrected figures 2-8 in this application.

The correction to figures 2-5 is as follows:

- a. figures 2-5 have been reformatted to correct the sizes of the margins in order to conform to the requirements of 37 CFR § 1.84(g).

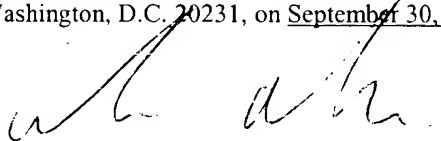
The corrections to figures 6-8 are as follows:

- a. figures 7 and 8 have been reformatted to correct the sizes of the margins in order to conform to the requirements of 37 CFR § 1.84(g).
- b. all descriptive text, other than text indicating the figure number, has been cancelled from figures 6-8 in order to conform to the requirements of 37 CFR § 1.84(o).

For the convenience of the Examiner, we attach as Exhibit 2 a copy of figures 6-8 as amended (without the redline).

It is submitted that the entry of the corrections to Figures 2-8 does not introduce new matter, and is proper. See 37 CFR § 121(a)(6). Accordingly, entry of the attached corrected drawing figures in the above referenced application, respectfully is requested. If the Examiner has any questions regarding this paper, please contact the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Box Missing Parts, Commissioner For Patents, Washington, D.C. 20231, on September 30, 2002.

  
\_\_\_\_\_  
Gonzalo Merino

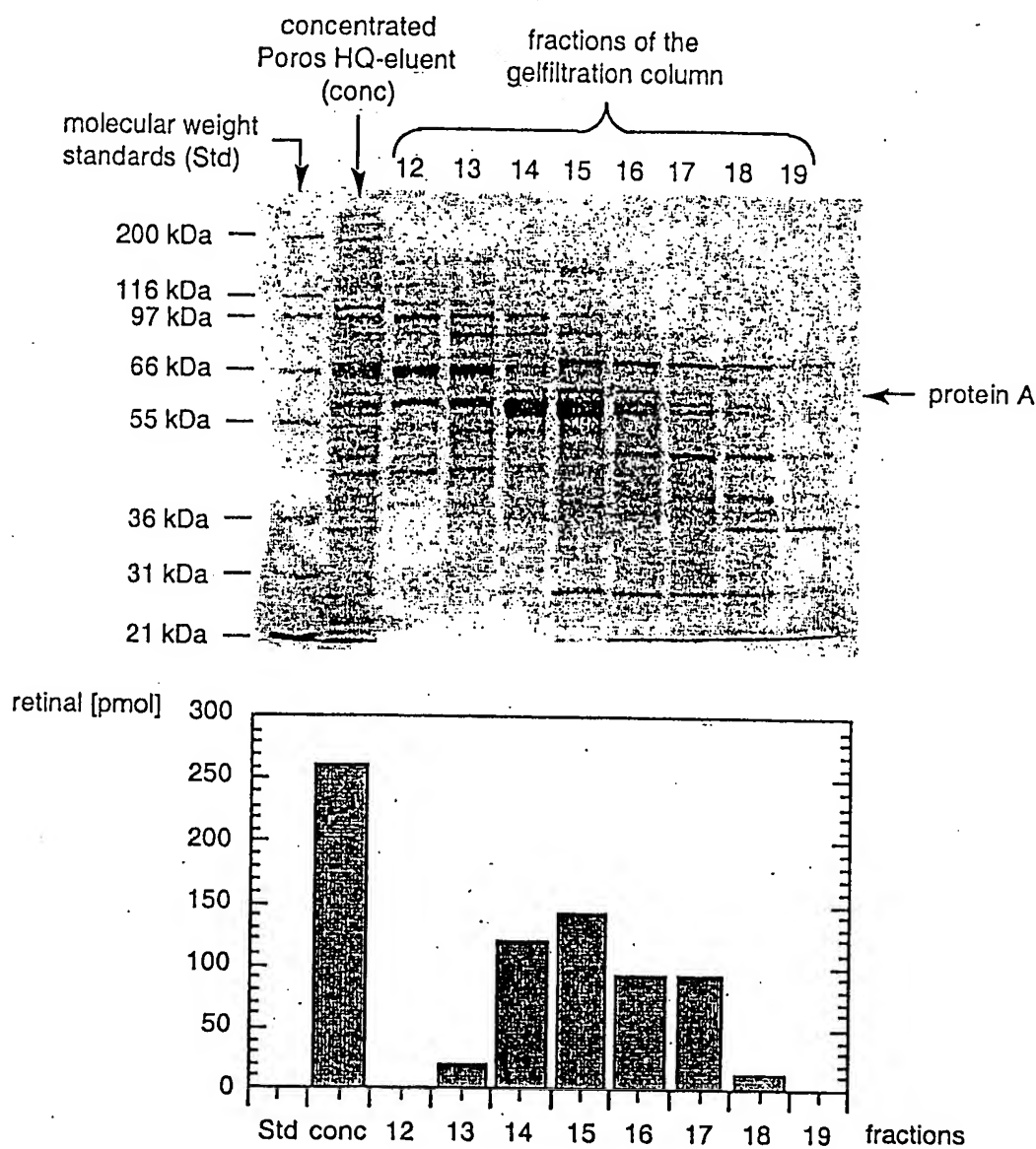
Respectfully submitted,

By: 

Gonzalo Merino  
Registration No. 51,192  
BRYAN CAVE LLP  
245 Park Avenue  
New York, NY 10167-0034  
(212) 692-1800



Figure 1



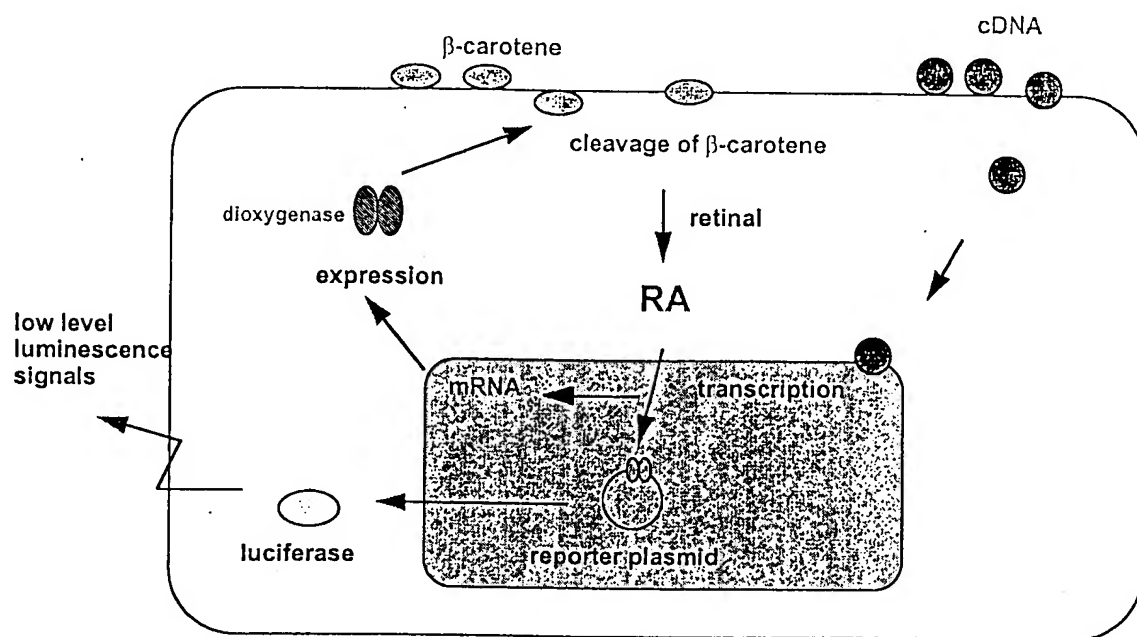


Figure 2



Figure 3  
No. 2

Seq. ID

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151 AGAAACAAAG AAGAGCATCC AGAGCCCATA AAAGCTGAGG  
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201 GTTGCCCACT TGGTTGCAAG GGGTACTTCT CCGAAATGGC  
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251 ACACAATAGG GGACACTAAA TACAACCACT GGTTTGATGG  
CTTGGCTCTG

301 CTGCACAGCT TCACGTTTAA AAATGGTGAA GTTTACTACA  
GAAGTAAGTA

351 CCTCCGAAGT GACACATACA ACTGCAATAT AGAAGCAAAC  
CGAATCGTGG

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AAACATATTT

451 GCCAAGGCAT TCTCATACTT ATCTCACACC ATTCCTGAGT  
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501 CTGCCTGATC AACATTATGA AACTGGGGA TGATTATTAT  
GCTACCACTG

551 AGACTAACTT CATCAGAAAA ATTGATCCAC AGACTCTGGA  
GACTAGAT

601 AAGGTAGACT ACAGCAAATA TGTAGCTGTA AACTTGGCAA  
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651 AACTATGAC AGTGCTGGAA ATATTCTCAA CATGGGTACT  
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701 ATAAAGGGAG AACAAAATAT GTTCTCTTTA AGATCCCTTC  
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751 GAAAAAGAAA AGAAGAAATC TTGTTTTAAA CACCTGGAAG  
TAGTATGCTC

801 CATCCCTTCT CGCTCCCTGC TCCAACCAAG CTACTACCAC  
AGCTTTGGAA

851 TCACAGAAAA TTATATTGTG TTCATAGAGC AGCCATTTAA  
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Figure 4  
No. 1

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TENYIVFIEQ

251 PFKLDIVKLA TAYIRGVNWA SCLSFHKEDK TWFHFVDRKT  
KKEVSTKFYT

301 DALVLYHHIN AYEEDGHVVF DIVAYRDNLS YDMFYLLKLD  
KDFEVNNKLT

351 SIPTCKRFVV PLQYDKDAEV GSNLVKLPTS ATAVKEKDGS  
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401 GIELPRVNYD YNGKKYKYVY ATEVQWSPVP TKIAKLVNQT  
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451 CWPSEPIFVP SPDAREEDEG VVLTCVVVSE PNKAPFLLIL  
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501 ATVNVEMHLD LHGMFIPQND LGAETE



Figure 5

Seq ID No. 4 and Seq ID No. 5

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119 70 HKFDFKEGHV TYHRRFIRTDAYVRAMTEKRIVITEFGFTTCAFPDPCKNI  
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203 . | | | | | | | : . | : | . | | : | | |  
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204 SVPEKEKKKSCFKHLEVVC SIPSRSL LQPSYYHSFGITENYIVFIEQPFK  
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266 218 LQADKEDPISKFTS.EIVVQFP CSDRFKPSYVHSFGLTPNYIVFVETPVK  
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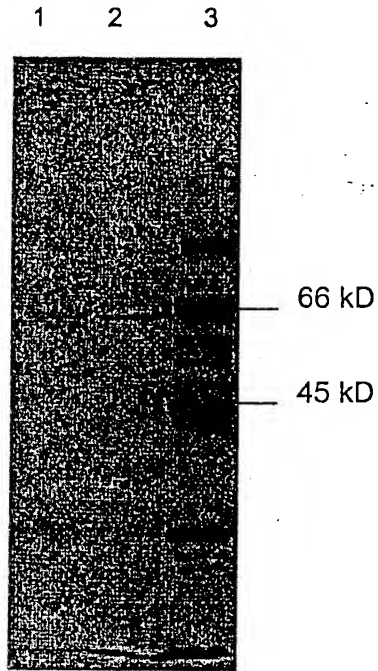


Fig. 6

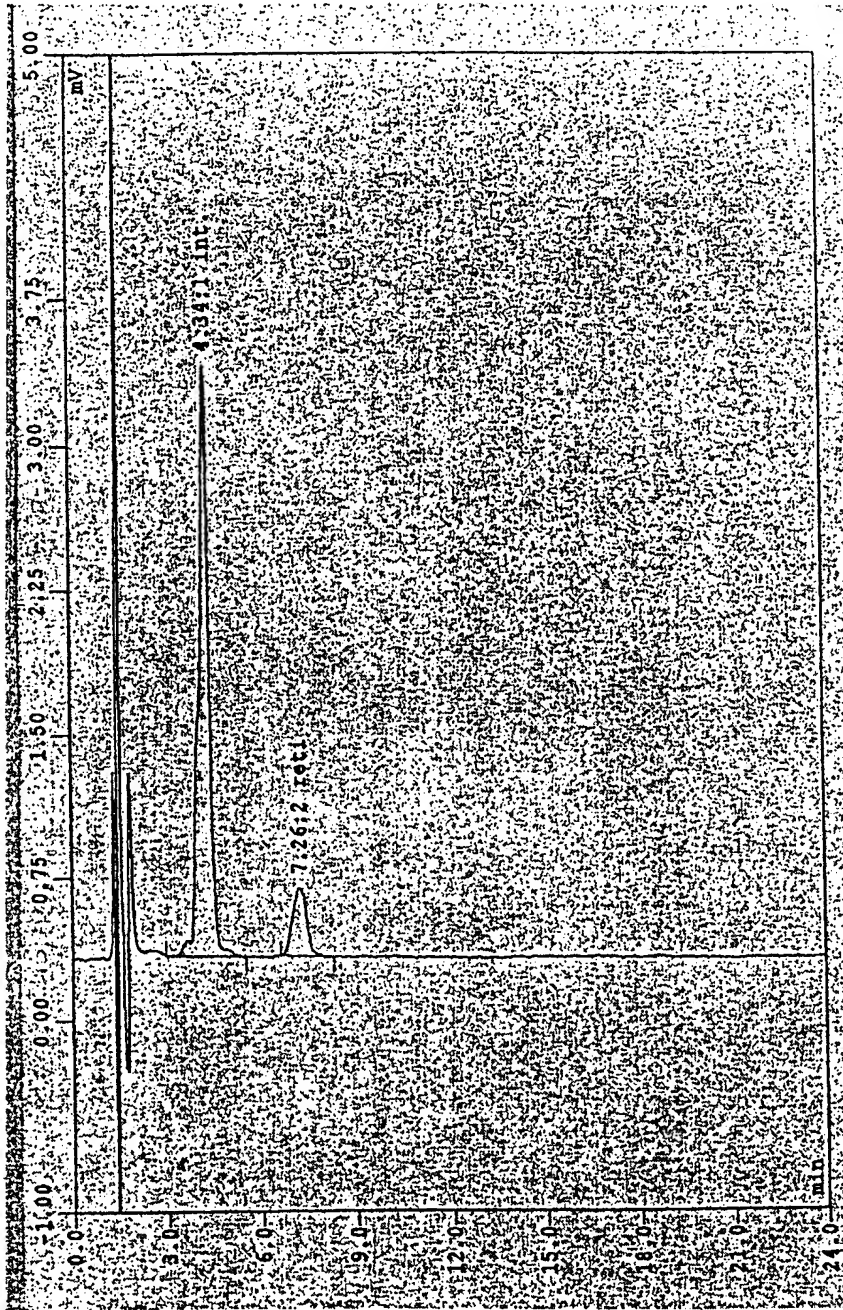


Fig. 7

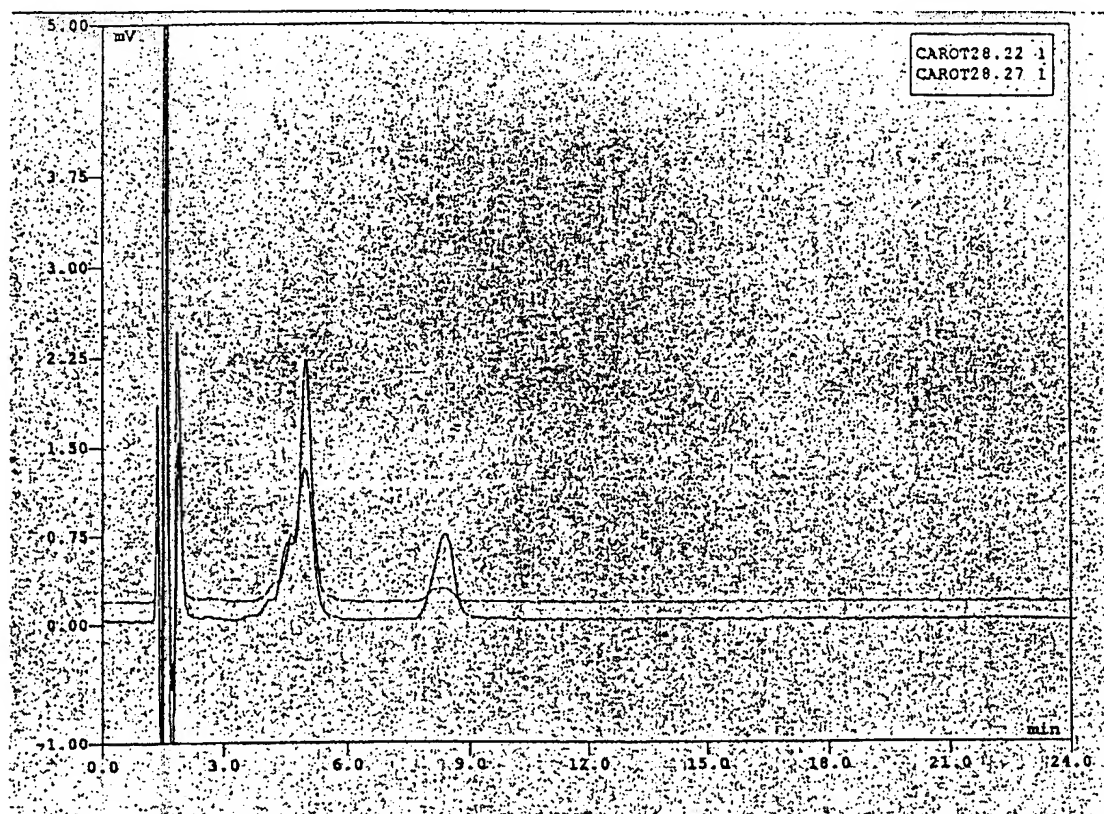
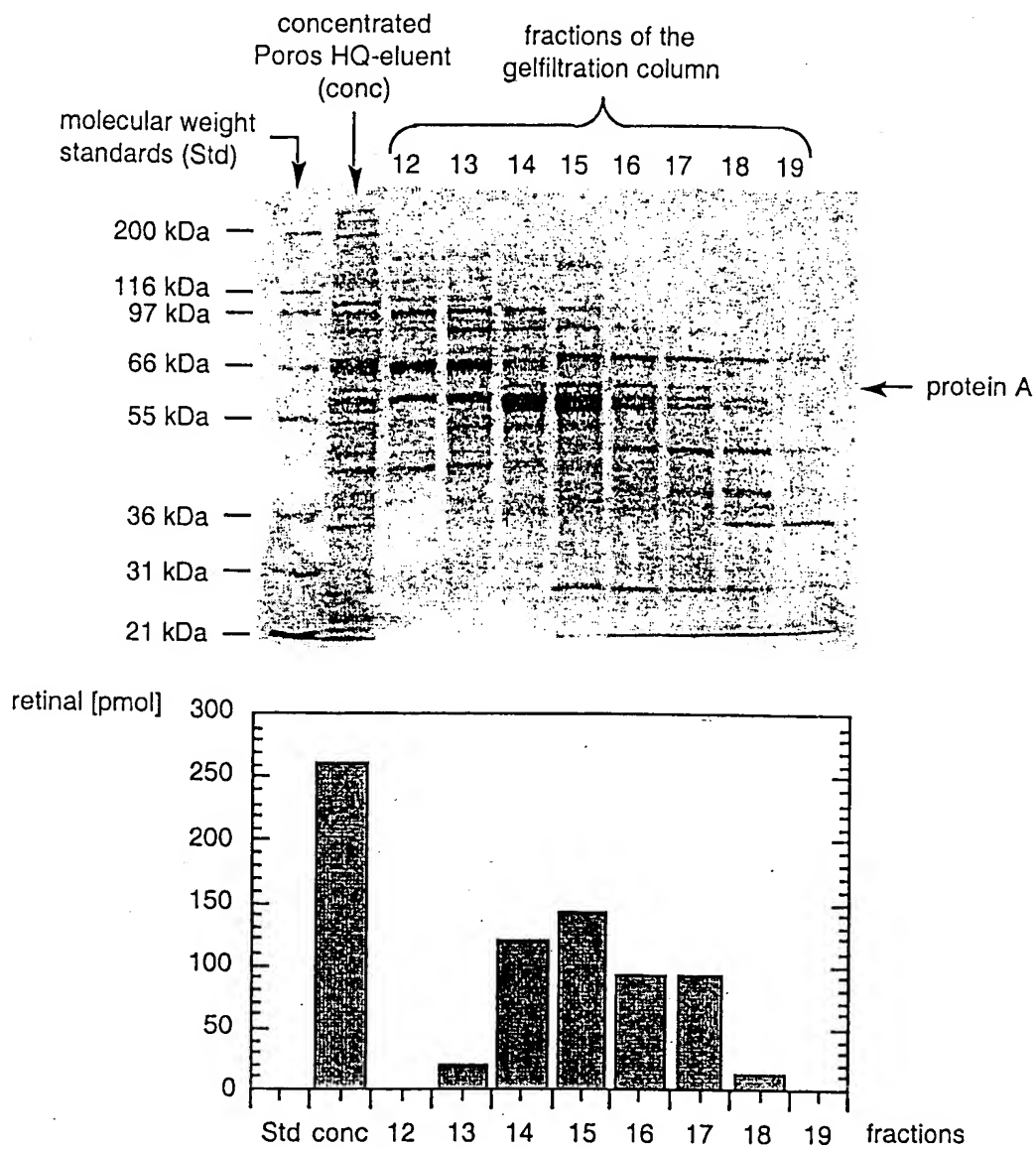


Fig. 8

Figure 1



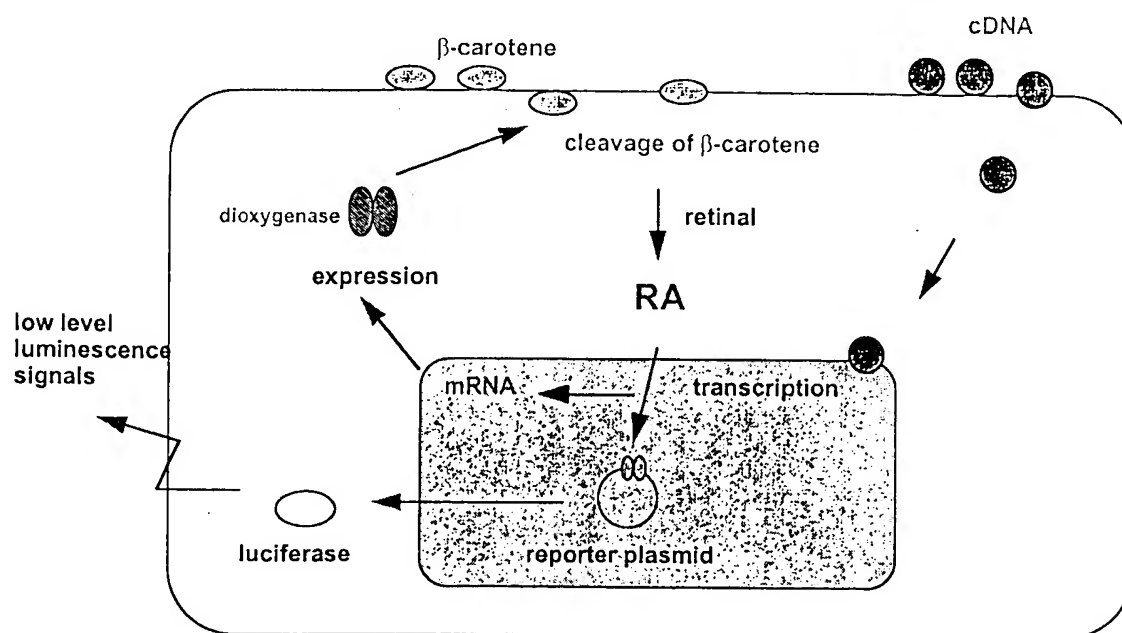


Figure 2





Figure 3  
No. 2

Seq. ID

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51 AACAGGAAAG AGCTGTTCTT AGCCCAGAGA GGAGGGCACC  
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CGAATCGTGG

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GAGACAACTT

1751 TCTACTGAAC ATGAGTTAAT ATCCCTTTTA CCATTCAAGA  
ACAACCATAT

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ATATAATCCT

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GCACAACTGG



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AGAAGTGCTA

1951 ATGTTGTACA TAACGGCGGC AGAGGGAACA GGAGAGAAAG  
GTAACGGGAA

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GCATTTTCTT

2201 GGTGCTCGAT TTACACTATA ACCAAAGTTA AGTATTACAT  
TCAGGTGCTA

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Figure 4  
No. 1

Seq. ID

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201 IPSSVPEKEK KKSCFKHLEV VCSIPSRLL QPSYYHSFGI  
TENYIVFIEQ

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KDFEVNNKLT

351 SIPTCKRFVV PLQYDKDAEV GSNLVKLPTS ATAVKEKDGS  
IYCQPEILCE

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KEVLHWGEDH

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Figure 5

Seq ID No. 4 and Seq ID No. 5

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515 PAYLLILNAKDLSEVARAEFTVEINIPVTFHGLF 548

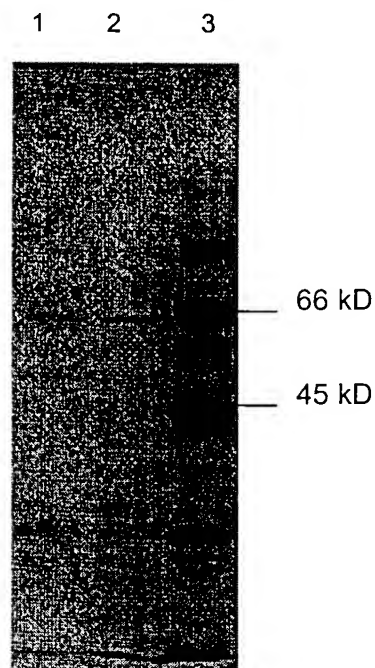


Fig. 6 shows a 10% polyacrylamide gel with E.coli expressed  $\beta,\beta$ -carotene 15,15'-monooxygenase after affinity tag purification; lane 1 and lane 2: 2 fractions from the  $\text{Co}^{2+}$ -chelate column showing the main band at 60 kD; lane 3: low range molecular weight marker (Bio Rad).



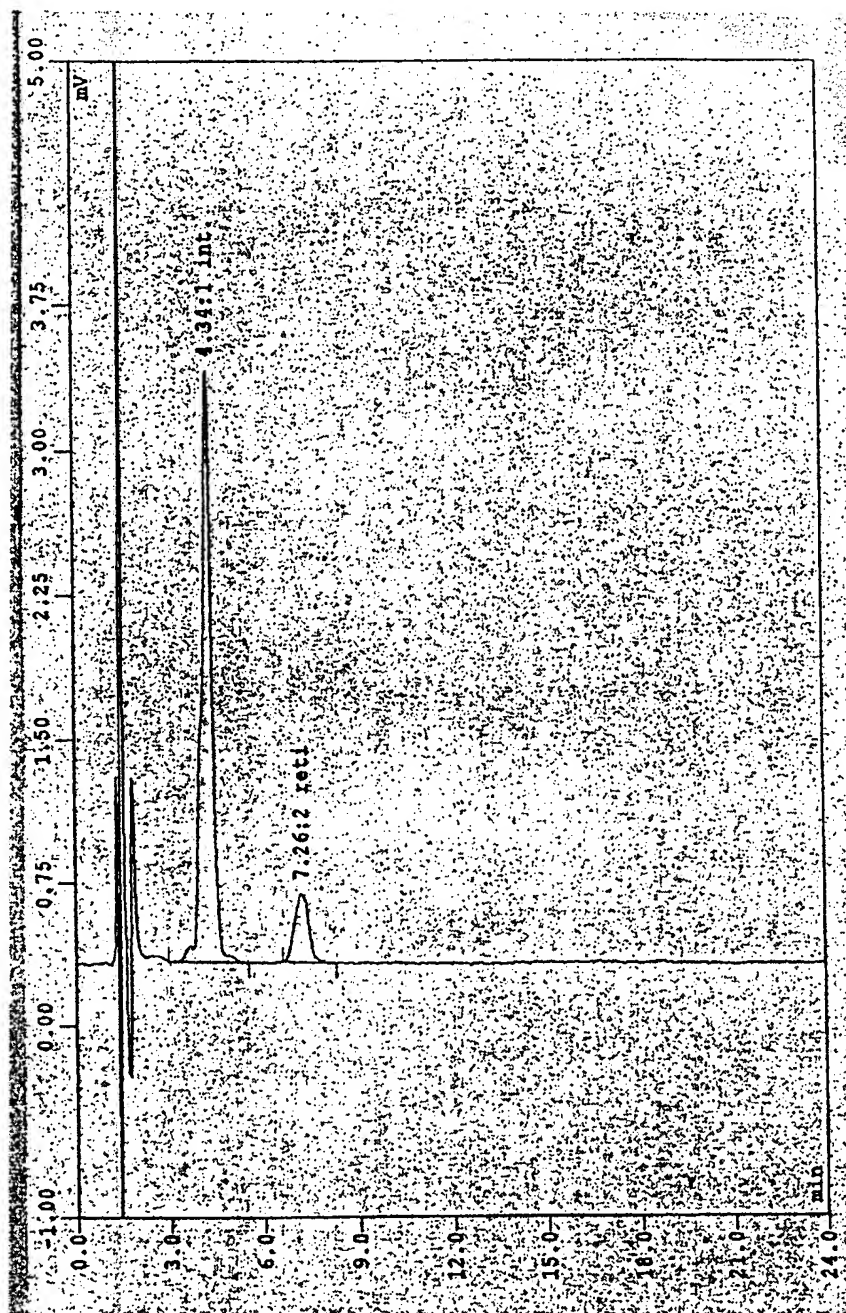


Fig. 7 shows an HPLC profile of the reaction mixture at the end of an activity assay for the  $\beta,\beta$ -carotene 15,15'-monooxygenase following the procedure in example 1. The first peak in the chromatogram represents the internal standard, while the second peak corresponds to retinal as the only product formed during the central cleavage with  $\beta$ -carotene as substrate.

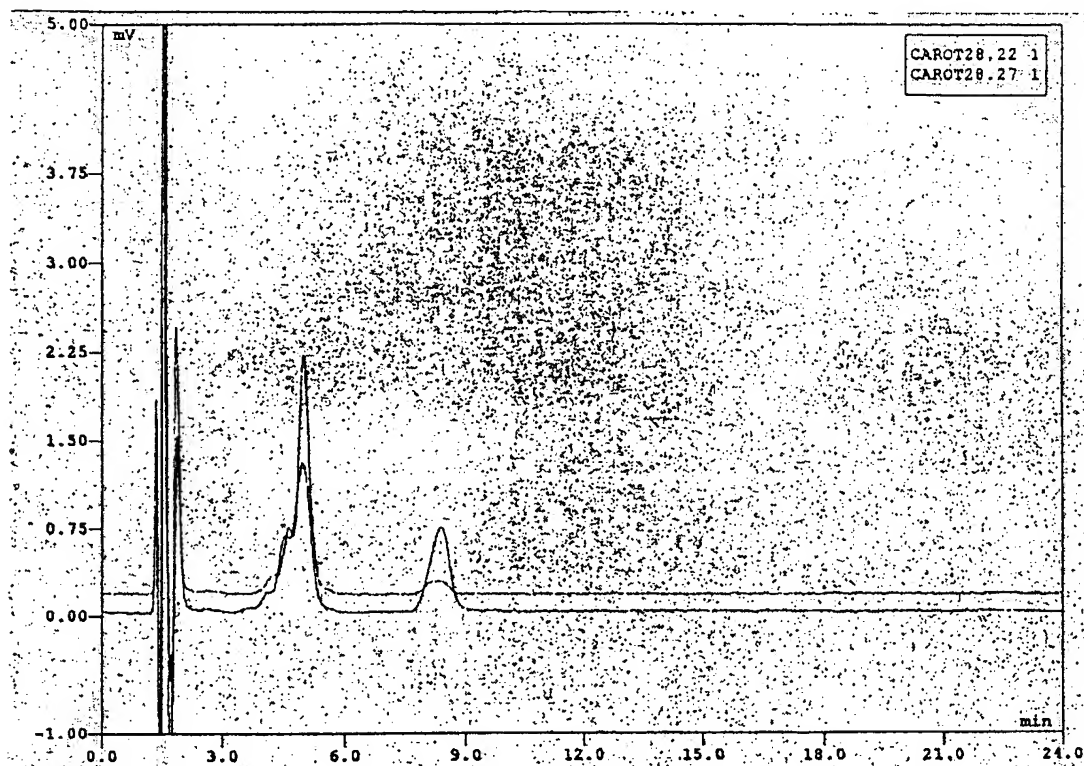


Fig. 8 confirms that the product peak in Fig. 7 is indeed retinal. A sample which was positive in the activity assay - (green (upper) chromatogram) was spiked with retinal and analysed in second HPLC run (red (lower) chromatogram). The chromatograms of the two runs were then overlayed.